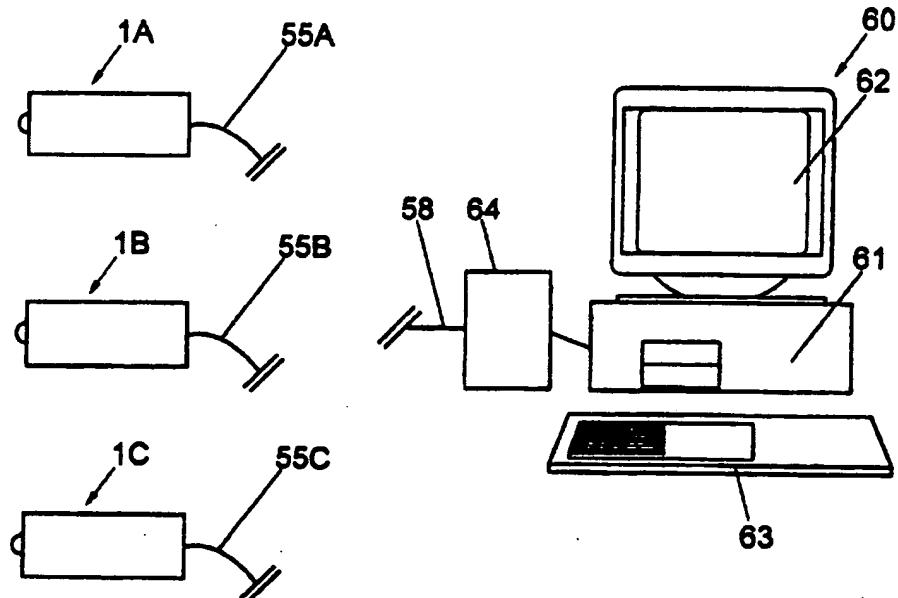




INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 6 : H04N 7/14	A1	(11) International Publication Number: WO 97/39580 (43) International Publication Date: 23 October 1997 (23.10.97)
(21) International Application Number: PCT/GB97/01042		(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ARIPO patent (GH, KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).
(22) International Filing Date: 15 April 1997 (15.04.97)		
(30) Priority Data: 9607770.6 15 April 1996 (15.04.96) GB		
(71) Applicant (for all designated States except US): EUROQUEST SOLUTIONS LIMITED [GB/GB]; Pentland House, Livingston EH54 6NG (GB).		
(72) Inventor; and		Published
(75) Inventor/Applicant (for US only): REID, Atholl [GB/GB]; Euroquest Solutions Limited, Pentland House, Livingston EH54 6NG (GB).		With international search report.
(74) Agent: MURGITROYD & COMPANY; 373 Scotland Street, Glasgow G5 8QA (GB).		

(54) Title: IMAGING SYSTEM



(57) Abstract

A front end unit (1) for use in an imaging system comprises a camera (10) to provide an image, a digitiser (20) to convert the image into digital data, a data processor (30) for manipulation and/or storage of the digitised image, and a modem (40) for rendering the digitised image suitable for transmission by telephone network. The camera, digitiser and data processor, and preferably the modem, are provided within a single housing (5). The elements are dedicated, enabling the housing to be made small. The unit is preferably suitable for connection direct to a telephone socket. A system including a remote host computer for receiving images from one or more front end units is also provided.

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece	ML	Mali	TR	Turkey
BG	Bulgaria	HU	Hungary	MN	Mongolia	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MR	Mauritania	UA	Ukraine
BR	Brazil	IL	Israel	MW	Malawi	UG	Uganda
BY	Belarus	IS	Iceland	MX	Mexico	US	United States of America
CA	Canada	IT	Italy	NE	Niger	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NL	Netherlands	VN	Viet Nam
CG	Congo	KB	Kenya	NO	Norway	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NZ	New Zealand	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	PL	Poland		
CM	Cameroon	KR	Republic of Korea	PT	Portugal		
CN	China	KZ	Kazakhstan	RO	Romania		
CU	Cuba	LC	Saint Lucia	RU	Russian Federation		
CZ	Czech Republic	LI	Liechtenstein	SD	Sudan		
DE	Germany	LK	Sri Lanka	SE	Sweden		
DK	Denmark	LR	Liberia	SG	Singapore		
EE	Estonia						

1 **IMAGING SYSTEM**

2

3 The present invention relates to an imaging system and
4 especially to an imaging system including the
5 transmission of images via a telephone network.

6

7 The transmission of digitised information which
8 represents images, via a telephone network, is known
9 and is commonly performed. Such transmission typically
10 involves a first sophisticated computer, equipped with
11 a modem, at a first end of a telephone line and a
12 second sophisticated computer equipped with a modem, at
13 a second end of the telephone line. Where the aim is
14 to capture images in the vicinity of the first
15 computer, a video camera is typically connected to the
16 first computer and data representing images captured by
17 the camera are transmitted via the telephone line to
18 the second computer. Systems are known in which
19 several cameras may be connected to the first computer
20 which may then transmit, via a modem, data representing
21 images from one or more of the cameras, to the second
22 computer. In such systems additional hardware such as
23 multiplex units may be required for use with the first
24 computer.

25

1 According to a first aspect of the present invention
2 there is provided a front end unit for use in an
3 imaging system said front end unit comprising: camera
4 means to provide an image; digitisation means to
5 convert said image into digital data; data processing
6 means; modem means for rendering said digital data
7 suitable for transmission by telephone network, wherein
8 said camera means, said digitisation means and said
9 data processing means are provided within a single
10 housing.

11

12 Preferably, said modem means is also provided within
13 said single housing.

14

15 Preferably, said digitisation means is dedicated for
16 use in said front end unit.

17

18 Preferably, said data processing means is dedicated for
19 use in said front end unit.

20

21 Preferably, said modem means is dedicated for use in
22 said front end unit.

23

24 Preferably, the camera means comprises a video camera.

25

26 Preferably, the front end unit includes data
27 compression means.

28

29 Preferably, the modem means comprises a modem for use
30 with ISDN, PSTN or network telecommunications systems.

31

32 Preferably, the front end unit includes a transmitter
33 for connection to a cellular telephone system or other
34 wireless telephony system.

35

36 Preferably, the data processing means includes a frame

1 grabber.

2

3 Preferably, the housing is not greater than about 15cm
4 by 15cm by 25cm in size.

5

6 Preferably, the front end unit includes two spaced
7 apart camera means each adapted to provide an image
8 from a slightly different view point, enabling a three
9 dimensional interpretation of the data provided by said
10 front end unit.

11

12 Preferably, the front end unit includes input means for
13 receipt of an image signal from a second or subsequent
14 front end unit, and at least one of the digitisation
15 means, data processing means and modem means acts upon
16 the image signal from the second or subsequent front
17 end unit.

18

19 According to a further aspect of the present invention
20 there is provided an imaging system including at least
21 one front end unit in accordance with the first aspect.
22

23 Preferably, the imaging system further includes a host
24 unit comprising a computer and a modem, said host unit
25 being located remote from said front end unit and
26 adapted to communicate with the front end unit via a
27 telephone connection.

28

29 Preferably, said host unit includes display means and
30 is adapted for displaying images communicated from the
31 front end unit.

32

33 Preferably, the host unit includes data storage means
34 for storing data relating to images communicated from
35 the front end unit.

36

1 Preferably, the host unit includes means for
2 manipulating or analysing images.
3

4 Preferably, the host unit includes means for
5 selectively interrogating one of a number of front end
6 units by communicating with said selected front end
7 unit via a corresponding selected telephone connection.
8

9 Preferably, the front end unit is adapted to initiate
10 communication with the host unit in response to a
11 triggering signal, or alarm signal, generated in
12 response to a stimulus in the vicinity of the front end
13 unit.

14

15 Preferably, the imaging system comprises:
16 a first front end unit in accordance with the
17 first aspect of the present invention, the first front
18 end unit including input means for receipt of an image
19 signal from a second or subsequent front end unit;
20 at least one second or subsequent front end unit,
21 in the vicinity of the first front end unit, without at
22 least one of a digitisation means, data processing
23 means or modem means, and wherein the system is adapted
24 to relay images from the second or subsequent front end
25 unit to the host unit by utilising the digitisation
26 means, data processing means and/or modem means of the
27 first front end unit.
28

29 According to a further aspect of the present invention,
30 there is provided a method of stock control including:
31 use of a plurality of spaced apart front end units in
32 order to provide images from which stock levels in
33 corresponding spaced apart areas can be determined.
34

35 The method of stock control may further comprise use of
36 a remote host unit to selectively interrogate a first

1 one of said plurality of front end units and to receive
2 one or more images from said selected front end unit
3 from which the stock level at the corresponding area
4 may be determined.

5

6 The method may further comprise using the host unit to
7 subsequently interrogate a second one of said plurality
8 of front end units and to receive one or more images
9 therefrom.

10

11 Preferably, the host unit runs stock control/ordering
12 software simultaneously with software enabling the
13 interrogation of the front end units and interpretation
14 of data received from said front end units.

15

16 Preferably, the use of the host unit to interrogate a
17 selected front end unit comprises the host unit
18 initiating connection to the front end unit by
19 selection of a telephone connection which corresponds
20 to the selected front end unit.

21

22 Embodiments of the present invention will be described,
23 by way of example, with reference to the accompanying
24 drawings in which:

25

26 Fig. 1a is a schematic illustration of an embodiment of
27 a front end unit for use in an imaging system in
28 accordance with the present invention;

29

30 Fig. 1b is a front view of the front end unit of Fig.
31 1a;

32

33 Fig. 2 is a schematic illustration of an imaging system
34 showing three mutually remote front end units and one
35 host unit.

36

1 Fig. 3 is a schematic illustration of an alternative
2 embodiment, showing four camera units in the same
3 vicinity with shared data processing means and modem in
4 the same housing as one of the cameras;

5

6 Fig. 4a is a schematic illustration of an embodiment of
7 a front end unit having two adjacent cameras;

8

9 Fig. 4b is a front view of the front end unit of Fig.
10 4a; and

11

12 Figs. 5 and 6 provide technical details of embodiments
13 of front end units in accordance with the present
14 invention.

15

16 With reference to Figs. 1a and 1b a front end unit 1,
17 for use in an imaging system, comprises camera means in
18 the form of a compact high-resolution colour video
19 camera 10, digitisation means 20 for digitising the
20 image provided by said video camera 10, data processing
21 means 30 and modem means in the form of a dedicated
22 modem 40, all housed in a compact housing 5. The
23 housing 5 is provided with a first aperture 6 at a
24 first end thereof through which light may reach a lens
25 12 of the video camera 10. The housing 5 is provided
26 with a second aperture at the second end thereof which
27 allows access to a socket 50 suitable for connection to
28 a telephone line.

29

30 The use of dedicated digitisation means 20, data
31 processing means 30 and modem 40 enables these
32 components to be constructed such that they are
33 extremely economical to produce and small in size. A
34 compact camera 10 is also used enabling the size of the
35 front end unit to be restricted to approximately the
36 same size as a conventional video camera.

1 Fig. 2 illustrates an imaging system having first,
2 second and third remotely located front end units 1A,
3 1B, 1C. The front end units 1A, 1B, 1C may be in
4 different cities or different countries and each is
5 connected to a respective telephone line 55A, 55B, 55C
6 via which connection to a telephone network can be
7 achieved. The system also includes a host unit,
8 generally designated 60 comprising a host computer 61
9 having output means, for example in the form of a
10 display screen 62, input means, for example in the form
11 of a keyboard 63 and modem means 64 connected to a
12 telephone line 58 via which connection to a telephone
13 network can be achieved. The host unit 60 can be used
14 to interrogate any of the front end units 1A, 1B, 1C
15 via the telephone network merely by accessing the
16 telephone line 55A, 55B, 55C corresponding to the
17 desired front end unit 1A, 1B, 1C. Typically,
18 therefore the host unit will have a database of
19 telephone numbers, each corresponding to a different
20 front end unit. The host unit 60 can be used to
21 manipulate the images received, for example enlarging
22 selected parts of said images.

23

24 The interrogation by the host unit may be high level as
25 commands sent by the host unit can be interpreted by
26 the respective data processing means 30 in each front-
27 end unit. The functions of the front end unit may thus
28 be controlled by the host unit, and the host unit may
29 also control front end mechanical devices (not shown),
30 such as means for selectively orienting or adjusting
31 the position of said front end unit.

32

33 It will be appreciated that the front end units 1A, 1B,
34 1C may be arbitrarily remote from each other and from
35 the host unit 60 provided that the host unit 60 and the
36 front end units 1A, 1B, 1C are connectable to a

1 telephone network. In a variation of this embodiment
2 one or more of the host unit and front end units may
3 include transmission means for wireless telegraphy of a
4 signal (such as is known from cellular telephone
5 technology) and may thus operate, and transmit or
6 receive images, in locations where no hard wired
7 telephone lines (or other image transmission lines)
8 exist.

9

10 Each unit also requires a source of electrical power
11 (not shown) and this will normally comprise connection
12 to electrical mains. However, portable or stand alone
13 electrical power sources could be used, for example
14 batteries or electricity generating means. Thus one or
15 more front end units may be fully portable. The host
16 unit, for example in the form of a lap-top computer
17 connected to a cellular telephone network, may also be
18 fully portable. A fully portable host unit may be of
19 particular value in enabling mobile emergency services
20 to view a remote target area, such as the scene of a
21 fire or crime, while travelling to said area.

22

23 The embodiment illustrated in Fig. 2 provides an
24 economical way of providing video images from
25 arbitrarily spaced apart areas to a host unit user.
26 Furthermore, the front end units being small and self
27 contained (except perhaps for power and telephone
28 connection lines) are easy to position, unobtrusive,
29 non-invasive, robust and interference-resistant.

30

31 An envisaged use for such a system is for stock control
32 in the circumstances where a supplier is responsible
33 for maintaining stocks of his product in a number of
34 retail establishments. One or more front end units
35 would be provided in the stock storage area of each
36 retail establishment and positioned so that the images

1 provided show the level of stock of the supplier's
2 product in each establishment. The supplier can then
3 check the level of stock in each location from a remote
4 host unit. Stock control and ordering software could
5 be run on the host unit simultaneously with imaging
6 software and a user can therefore view the retailer
7 details, ideal stock levels etc as well as the image
8 showing the actual stock levels and, if required,
9 immediately requisition further stock. This system is
10 much more efficient than a system requiring travel to,
11 and manual inspection of stock at, each retail outlet.
12 The enhanced efficiency would enable rapid recovery of
13 the capital expenditure involved in installing such a
14 system.

15

16 Embodiments of systems in accordance with the present
17 invention may be beneficially used in applications
18 other than stock control, and there are many
19 applications in which it is desirable to access visual
20 images from remote locations. Applications include:
21 monitoring of industrial processes, for example in oil
22 and gas production; industrial line inspection;
23 security surveillance; fire monitoring; traffic and
24 motorway surveillance; automated telling machine
25 surveillance; customer monitoring; vision control and
26 personal property monitoring. The host unit may
27 display images enabling a user to inspect the images
28 and decide on and initiate an appropriate course of
29 action. Alternatively, the host unit may run software
30 to enable automatic analysis of the images and
31 initiation of data logging or action to be taken. For
32 example a system having a suitably positioned front end
33 unit could be used to automatically recognise and log
34 the registration details of all vehicles entering or
35 leaving a given area.

36

1 A variation of an embodiment of a system in accordance
2 with the present invention includes front end units
3 which, rather than waiting to be interrogated by the
4 host unit, initiate communication with the host unit
5 and transmission of images in response to a stimulus in
6 the vicinity of the front end unit. The stimulus may
7 be provided by, for example, a burglar alarm system, a
8 fire detection system, motion detection system etc.
9 The alarm or other means of providing stimulus could be
10 external to the front end unit or included as part of
11 the front end unit.

12

13 A host unit may be provided with a number of telephone
14 lines for simultaneous communication with a number of
15 front end units. In this case the host system may use
16 a split screen display to simultaneously display images
17 from a number of front end units.

18

19 There are applications in which a number of cameras are
20 provided in close proximity. In such applications it
21 is possible to provide a number of front end units each
22 including a camera 10, digitisation means 20, data
23 processing means 30 and a modem 40, and for some
24 applications (such as where damage to front end units
25 is likely) the high level of redundancy that this
26 provides is desirable. In applications where such
27 redundancy is not required a cost saving can be
28 obtained by providing a number of front end units each
29 of which include a camera but which have some shared
30 components.

31

32 Fig. 3 shows a first front end unit 101 including a
33 camera 10, digitisation means 20, data processing means
34 30 and a modem 40. The first front end unit also
35 includes a plurality of input sockets 108 enabling
36 connection to second and subsequent front end units,

1 shown in the illustrated embodiment as second, third
2 and fourth front end units 101A, 101B, 101C. The
3 second, third and fourth front end units 101A, 101B,
4 101C each include a camera 110A, 110B, 110C,
5 digitisation means 120A, 120B, 120C and output means
6 125A, 125B, 125C for connection to the sockets 108 of
7 the first front end unit. The second, third and fourth
8 front end units 101A, 101B, 101C do not include data
9 processing means or a modem but instead rely upon these
10 elements of the first front end unit 101 for
11 transmission of images to a host unit (not shown).
12

13 Systems could include an arbitrary number of second and
14 subsequent front end units which rely upon components
15 housed in a first front end unit for image
16 transmission. The second and subsequent front end
17 units could be provided without digitisation means, in
18 which case they would transmit analogue image signals
19 to the first front end unit for digitisation by the
20 digitisation means provided therein.

21
22 Although in the above description the camera means,
23 digitisation means, data processing means and modem
24 means have been described, for convenience, as separate
25 entities, it is of course possible for two or more of
26 these elements to be in the form of a single component.
27 For example, cameras which provide digital output could
28 be provided.

29
30 The data processing means may include a considerable
31 data storage capacity. This allows, for example,
32 storage of images taken over an extended period, for
33 downloading to a host unit during a relatively short
34 connection time. This enhances efficiency and allows
35 pre-event images to be retrieved even if it is only
36 decided that they are required after the event has

1 occurred. This is of particular value in a system in
2 which transmission of images is triggered by an alarm
3 (such as a fire alarm or security alarm) in the
4 vicinity of the front end unit, as it allows access to
5 images leading up to the event that triggered the
6 alarm. A preferred embodiment therefore comprises a
7 front end unit in which images are constantly written
8 to memory. Stored images preferably include time, date
9 and/or camera location information.

10

11 Fig. 4a shows schematically a front end unit 401 having
12 first and second video cameras 410A, 410B within a
13 single housing 405. The front end unit 401 includes
14 respective first and second digitisation means 420A,
15 420B for the first and second video cameras 410A, 410B.
16 The front end unit 401 also includes data processing
17 means 430 and modem means 440 to enable connection to a
18 telephone network. Fig. 4b shows a front view of the
19 front end unit 401. The objective lenses 412A, 412B of
20 the first and second video cameras 410A, 410B are
21 spaced apart by a fixed distance and thus provide
22 images from slightly different viewpoints. By using
23 known techniques this enables construction of a three
24 dimensional model of the images in the host unit (not
25 shown).

26

27 Figs. 5 and 6 provide details of technical data
28 relating to preferred embodiments of a front end unit.
29

30 Embodiments of the present invention provide a compact,
31 economical front end unit suitable for connection
32 direct to a telephone socket. This enables an imaging
33 system, for transmission of images from a number of
34 arbitrarily distant front end units to an arbitrarily
35 distant host unit, to be provided extremely
36 economically with a minimum of hard-wiring. A desired

1 front end unit can be interrogated merely by selecting
2 a corresponding telephone number from the host unit.

3

4 Modifications and improvements may be incorporated
5 without departing from the scope of the invention, and
6 elements hereinbefore described could be replaced by
7 functional equivalents thereof.

8

1 CLAIMS

2

3 1. A front end unit for use in an imaging system said
4 front end unit comprising:
5 camera means to provide an image;
6 digitisation means to convert said image into
7 digital data;
8 data processing means;
9 modem means for rendering said digital data
10 suitable for transmission by telephone network, wherein
11 said camera means, said digitisation means and said
12 data processing means are provided within a single
13 housing.

14

15 2. A front end unit according to Claim 1, wherein
16 said modem means is also provided within said single
17 housing.

18

19 3. A front end unit according to either preceding
20 claim, wherein said digitisation means is dedicated for
21 use in said front end unit.

22

23 4. A front end unit according to any preceding claim,
24 wherein said data processing means is dedicated for use
25 in said front end unit.

26

27 5. A front end unit according to any preceding claim,
28 wherein said modem means is dedicated for use in said
29 front end unit.

30

31 6. A front end unit according to any preceding claim,
32 wherein the camera means comprises a video camera.

33

34 7. A front end unit according to any preceding claim,
35 wherein the front end unit includes data compression
36 means.

1 8. A front end unit according to any preceding claim,
2 wherein the modem means comprises a modem for use with
3 ISDN, PSTN or network telecommunications systems.
4

5 9. A front end unit according to any preceding claim,
6 further including a transmitter for connection to a
7 cellular telephone system or other wireless telephony
8 system.
9

10 10. A front end unit according to any preceding claim,
11 wherein the data processing means includes a frame
12 grabber.
13

14 11. A front end unit according to any preceding claim,
15 wherein the housing is not greater than about 15cm by
16 15cm by 25cm in size.
17

18 12. A front end unit according to any preceding claim,
19 including two spaced apart camera means each adapted to
20 provide an image from a slightly different view point,
21 enabling a three dimensional interpretation of the data
22 provided by said front end unit.
23

24 13. A front end unit according to any preceding claim,
25 having input means for receipt of an image signal from
26 a second or subsequent front end unit, and wherein at
27 least one of the digitisation means, data processing
28 means and modem means acts upon the image signal from
29 the second or subsequent front end unit.
30

31 14. An imaging system including at least one front end
32 unit according to any preceding claim.
33

34 15. An imaging system according to Claim 14, further
35 including a host unit comprising a computer and a
36 modem, said host unit being located remote from said

1 front end unit and adapted to communicate with the
2 front end unit via a telephone connection.
3

4 16. An imaging system according to Claim 15, wherein
5 said host unit includes display means and is adapted
6 for displaying images communicated from the front end
7 unit.
8

9 17. An imaging system according to either of Claims 15
10 or 16, wherein the host unit includes data storage
11 means for storing data relating to images communicated
12 from the front end unit.
13

14 18. An imaging system according to any of Claims 15 to
15 17, wherein the host unit includes means for
16 manipulating or analysing images.
17

18 19. An imaging system according to any of Claims 15 to
19 18, wherein the host unit includes means for
20 selectively interrogating one of a number of front end
21 units by communicating with said selected front end
22 unit via a corresponding selected telephone connection.
23

24 20. An imaging system according to any of Claims 15 to
25 19, wherein the front end unit is adapted to initiate
26 communication with the host unit in response to a
27 triggering signal, or alarm signal, generated in
28 response to a stimulus in the vicinity of the front end
29 unit.
30

31 21. An imaging system according to any of Claims 15 to
32 20, comprising:
33

34 a first front end unit according to Claim 13;
35 at least one second or subsequent front end unit,
36 in the vicinity of the first front end unit, without at
 least one of a digitisation means, data processing

1 means or modem means, and wherein the system is adapted
2 to relay images from the second or subsequent front end
3 unit to the host unit by utilising the digitisation
4 means, data processing means and/or modem means of the
5 first front end unit.

6

7 22. A method of stock control including:

8 use of a plurality of spaced apart front end units
9 according to any of Claims 1 to 13, in order to provide
10 images from which stock levels in corresponding spaced
11 apart areas can be determined.

12

13 23. A method of stock control according to Claim 22,
14 further comprising use of a remote host unit to
15 selectively interrogate a first one of said plurality
16 of front end units and to receive one or more images
17 from said selected front end unit from which the stock
18 level at the corresponding area may be determined.

19

20 24. A method of stock control according to Claim 23,
21 further comprising using the host unit to subsequently
22 interrogate a second one of said plurality of front end
23 units and to receive one or more images therefrom.

24

25 25. A method of stock control according to either of
26 Claims 23 or 24, wherein the host unit runs stock
27 control/ordering software simultaneously with software
28 enabling the interrogation of the front end units and
29 interpretation of data received from said front end
30 units.

31

32 26. A method of stock control according to any of
33 Claims 23 to 25, wherein the use of the host unit to
34 interrogate a selected front end unit comprises the
35 host unit initiating connection to the front end unit
36 by selection of a telephone connection which

- 1 corresponds to the selected front end unit.
- 2
- 3

1/4

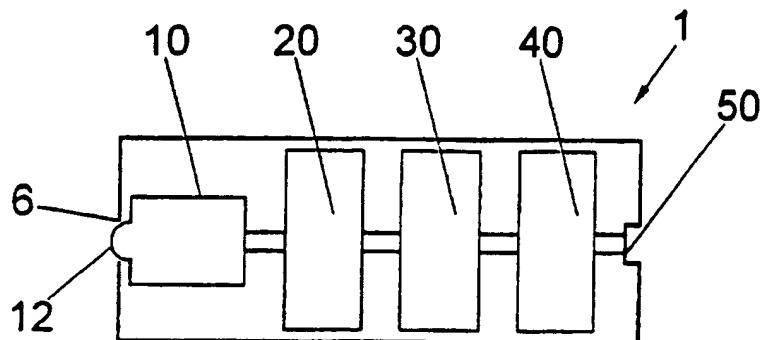


Fig. 1a 5

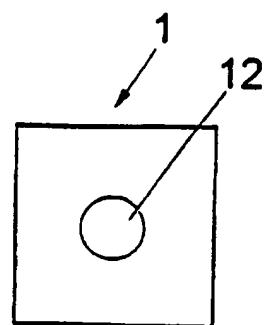


Fig. 1b

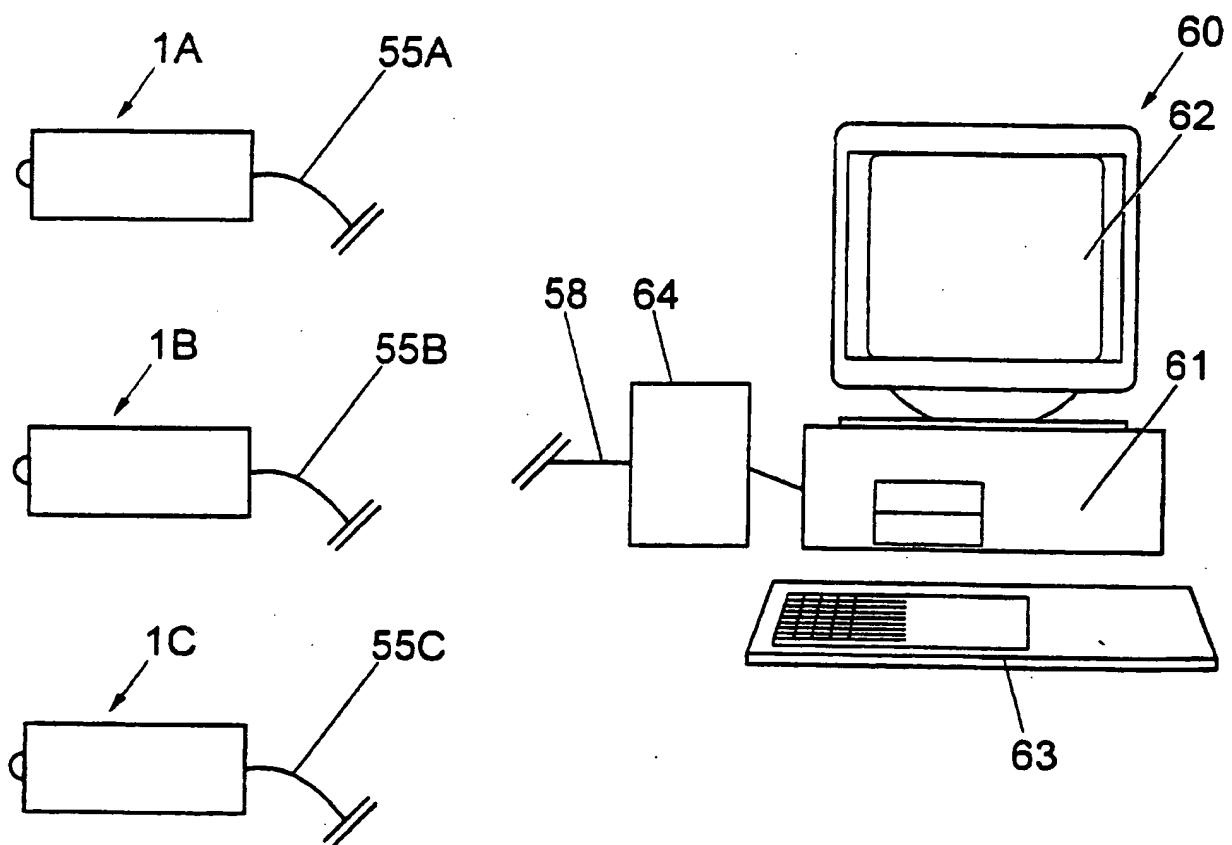
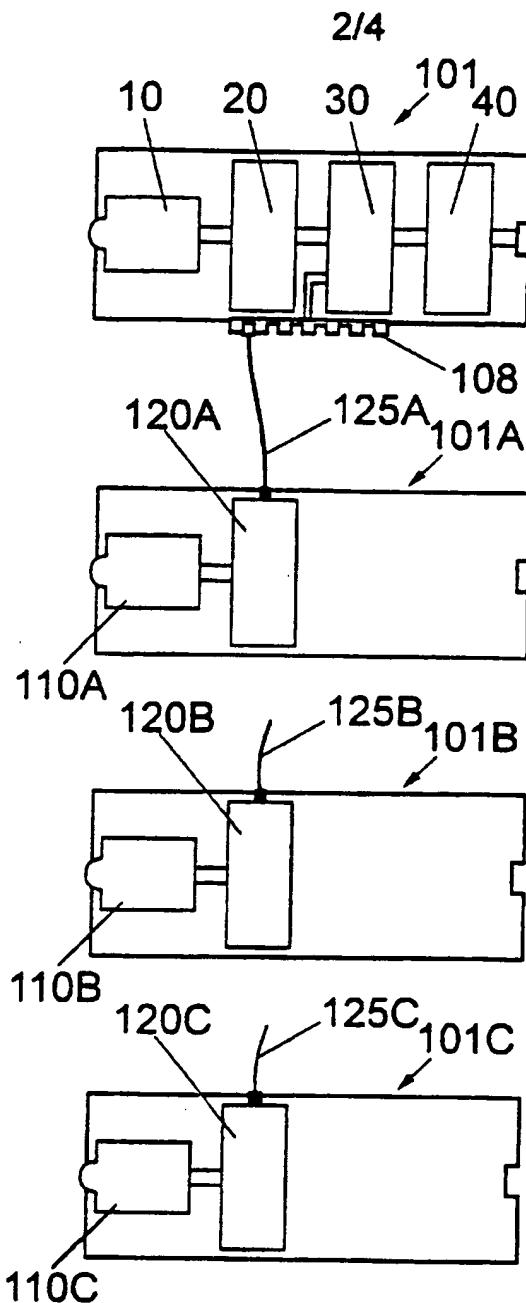
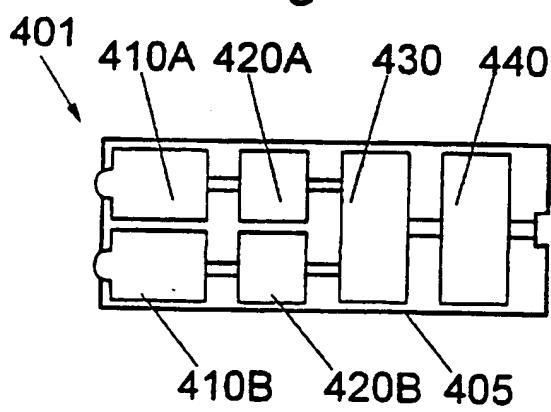
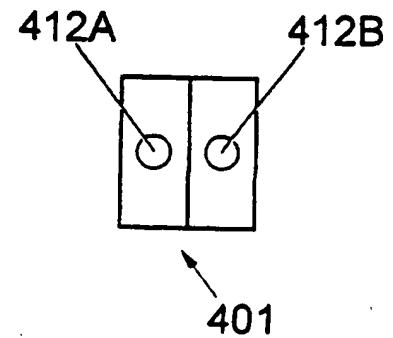


Fig. 2

*Fig. 3**Fig. 4a**Fig. 4b*

3/4

Fig. 5

TECHNICAL SPECIFICATION

CAMERA MODULE		
Sensor Type	Colour CCD	
Image Sensor Area	Total Pixel	795(H) x 596(V)
Resolution	Effective Pixel	792(H) x 582(V)
	Horizontal	470TV Lines
	Vertical	580TV Lines
VIDEO CAPTURE MODULE		
Resolution		768(H) x 576(V)
Video Inputs	Six analogue inputs (six times CVBS or three times Y/C, or combinations)	
Video Output Format		4:2:2 YUV, 16 Bit
Video Memory		512K x 16 Bits
CONTROLLER MODULE		
CPU	Am188EM	8-bit controller
Program Memory	Flash Memory	512 x 8-bits
System RAM	SRAM	128 x 8-bits
Watchdog Timer	within the Am188EM	
Serial Interface	Automatically resets the microcontroller CPU in case of hang up	
Parallel Interface	For test and Diagnostics	
Real Time Clock	Four inputs, four Outputs	
	Date and Time information managed through a RTC device connected to a rechargeable lithium battery.	
Power Management	RAM within the device to reduce power consumption, a sleep module is provided which turns off power to the Camera and Video Capture Modules. When sleep mode is active, power is automatically switched to the Camera Video Capture Modules on receipt of an incoming call or a change in condition of one of the parallel inputs.	
COMMUNICATION MODULE		
ISDN	ISDN 2	128 Kbits/sec
PSTN/PCMCIA module available	DSSI European Standard Protocol	
Network/PCMCIA module available		
POWER SUPPLY		
Supply Type	Switched Mode	
Outputs Provided	+5v, +12V, -12V	
Maximum Load	20 Watts	
SYSTEM DETAILS		
Power Requirements	120 V ac or 240 V ac	
Power Consumption	Approximately 12 Watts maximum	
EXTERNAL CONNECTIONS		
ISDN	RJ45 Socket	
Serial/Parallel	25 Pin D-Type Connector	
External Video	75R BNC	

4/4

Fig. 6

TECHNICAL SPECIFICATION

CAMERA MODULE		
Sensor Type	Colour CCD	
Image Sensor Area	Total Pixel	
Resolution	Effective Pixel	795(H) x 596(V)
Lens Type	Horizontal	752(H) x 582(V)
	Vertical	470TV Lines
	Integrated 4mm lens	580TV Lines
VIDEO CAPTURE MODULE		
Resolution		768(H) x 576(V)
Video Inputs	Six analogue inputs (six times CVBS or three times Y/C, or combinations)	
Video Output Format		4:2:2 YUV, 16 Bit
Video Memory		512K x 16 Bits
CONTROLLER MODULE		
CPU	32 bit Processor	486 DX
Program Memory	DRAM	4 M Bytes
System RAM	DRAM	4 M Bytes
Image Storage	Hard Disk	1 GB, 4 GB
Watchdog Timer	Automatically resets the CPU in case of hang up	
Serial Interface	For test and Diagnostics	
Parallel Interface	Four inputs, four Outputs	
Real Time Clock	Date and Time Information	
COMMUNICATION MODULE		
ISDN	ISDN 2 DSSI European Standard Protocol	128 Kbits/sec
PSTN/PCMCIA module		33.6 Kbits/sec
Network module available		Handset dependent
POWER SUPPLY		
Supply Type	Switched Mode	
Outputs Provided	+5v, +12V, -12V	
Maximum Load	20 Watts	
SYSTEM DETAILS		
Power Requirements	120 V ac or 240 V ac	
Power Consumption	Approximately 12 Watts maximum	
EXTERNAL CONNECTIONS		
ISDN	RJ45 Socket	
Parallel	25 Pin D-Type Connector	
Serial	9 Pin D-Type Connector	
External Video	15 pin D-Type Connector	

INTERNATIONAL SEARCH REPORT

Internal Application No
PCT/GB 97/01042

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 H04N7/14

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 H04N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 2 274 044 A (CHATER JOHN CHARLES ;CHATER IAN (GB); CHATER GUY (GB)) 6 July 1994 see page 7, line 11 - page 9, line 3 see figures 1-9 ---	1,3-8, 13-19, 21-26
X	NTT REVIEW, vol. 6, no. 4, 1 July 1994, pages 70-78, XP000460340 HIROYUKI MATSUI ET AL: "AN ISDN BASIC INTERFACE VIDEOPHONE" see the whole document ---	1-8,10, 11,13, 14,22
X	EP 0 500 091 A (HITACHI LTD) 26 August 1992 see page 7, column 10, line 10 - page 12, column 19, line 46 see figures 1-13 -----	1-8, 12-14

Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
- *&* document member of the same patent family

Date of the actual completion of the international search 31 July 1997	Date of mailing of the international search report 07.08.97
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer Van der Zaal, R

INTERNATIONAL SEARCH REPORT

Information on patent family members

Internal	Application No
PCT/GB	97/01042

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 2274044 A	06-07-94	AU 6112894 A CA 2157036 A CN 1118646 A EP 0686335 A WO 9419907 A HK 154496 A JP 8510099 T US 5598351 A	14-09-94 01-09-94 13-03-96 13-12-95 01-09-94 23-08-96 22-10-96 28-01-97
EP 0500091 A	26-08-92	JP 4265086 A US 5396269 A	21-09-92 07-03-95